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In fig. *C* the circle *a* is cut out to fit closely about the narrowest part of the neck of the homeopathic vial (*k*) containing the glycerine jelly (*j*). The radiating lines *a-b*, etc., are cut with a fret saw and the metal portions between them bent out (one at a time) until *a* is large enough to allow the top of the vial to be thrust through.

The metal is then bent back and the bottle is held as shown in fig. *A*.

To place jelly on slide, remove the glass rod (*l*) and cork (*y*) together, and touch end of rod to the warm slide on *xb*. If more jelly is required, repeat.

To prepare for use, pour into *xa* sufficient hot water to raise the level to *h*, when vial *k* is in position, and place lamp with *small flame* in position. As soon as jelly is fluid it is ready for use and will remain so as long as the water level is kept above the tube *c*<sup>1</sup>, and the lamp is kept burning. The circulation of water, which should never *boil*, is indicated by the arrows.

## THE DICRANUMS.—II.

It is hoped that the following purely artificial key may prove of value to beginners:

- 1—Capsule cernuous, more or less arcuate. . . . . 2  
     Capsule erect, symmetric. . . . . 14
- 2—Upper leaf cells longer than broad, porose. . . . . 3  
     “ “ “ not porose, nearly as broad as  
     long. . . . . 5.
- 3—Capsules clustered, leaves strongly transverse-  
     ly undulate, silky. . . . . *undulatum*.  
     Capsules solitary. . . . . 4.
- 4—Leaves transversely undulate when moist,  
     slightly or not at all secund; costa without  
     lamellæ at back. . . . . *Bonjeani*.  
     Leaves not at all undulate, secund, with  
     strongly serrate lamellæ at back. . . . . *scoparium*.
- 5—Leaves strongly papillose at back, little or not  
     at all secund. . . . . *spurium*.  
     Leaves not noticeably papillose. . . . . 6.
- 6—Capsules clustered. . . . . *Drummondii*.  
     Capsules solitary (rarely two together in *Mühl-*  
     *enbeckii*). . . . . 7
- 7—Costa not reaching apex. . . . . *Bergeri*.  
     Costa percurrent or excurrent. . . . . 8

- 8—Lower leaf cells more or less porose; capsules not strumose (except slightly so in *D. pallidum*). . . . . 9  
 Leaf cells not at all porose; capsules strumose. . . . . 12
- 9—Leaves entire or very faintly denticulate. . . . . *elongatum*.  
 Leaves serrulate. . . . . 10
- 10—Leaves strongly falcate-secund; upper leaf cells regular. . . . . *fuscescens*.  
 Leaves little or not at all secund; upper leaf cells very irregular. . . . . 11
- 11—Costa at least  $\frac{1}{3}$  width of leaf at the broadest point of the leaf. Plants 3-6 cm. high. . . . . *Mühlenbeckii*.  
 Costa  $\frac{1}{10}$  width of leaf; plants 2-3 cm. high. . . . . *pallidum*.
- 12—Leaves falcate-secund. . . . . 13  
 Leaves spreading. . . . . *schisti*.
- 13—Leaves with distinct angular cells; capsule oblong-cylindric. . . . . *Starkei*.  
 Leaves with few angular cells; capsule short, obovate . . . . . *falcatum*.
- 14—Costa ending in the serrulate apex; leaves curled when dry. . . . . 15  
 Costa excurrent; leaves scarcely altered by drying (except *D. fulvellum* and *D. fulvum*) . . . . . 16
- 15—Apex of leaf papillose at back; upper leaf cells rectangular. . . . . *montanum*.  
 Apex of leaf not papillose; upper leaf cells less regular; plants commonly giving off numerous axillary erect flagellæ bearing minute ecostate leaves. . . . . *flagellare*.
- 16—Costa narrow,  $\frac{1}{3}$  to  $\frac{1}{4}$  width of leaf at base. 17  
 Costa broader,  $\frac{1}{3}$  to  $\frac{1}{2}$  width of leaf. . . . . 18
- 17—Dioicous; 3-4 cm. or more high. . . . . *Sauteri*.  
 Autoicous; 0.5-2 cm. high. . . . . *fulvellum*.
- 18—Margin and costa of leaves entire; apex usually broken. . . . . *viride*.  
 Margin and costa of leaves serrulate. . . . . 19
- 19—Costa equalling  $\frac{1}{3}$  width of leaf at the base, or less; leaves gradually narrowed to apex; all upper surface leaf cells rectangular. . . . . *fulvum*.  
 Costa  $\frac{1}{3}$  width of base of leaf, or more; leaves abruptly narrowed to a long slender point; all upper leaf cells greatly elongated-linear. . . . . *longifolium*.

Look on the summit of your highest accessible hill or mountain for the long-leaved Dicranum (*D. longifolium*). It grows on stone walls and exposed rocks. It is usually sterile, but is easily recognized and distinguished from the fulvous Dicranum

by the characters given in the key. *D. Drummondii* grows in much the same situations as the wavy *Dicranum*, and is frequently mingled with it. Its capsules are also clustered and the leaves slightly wavy. The waviness of the leaves is much less marked and the plants have not the same silky sheen. The upper leaf cells are much shorter, nearly as broad as long and afford a sure ground for distinction. *D. viride* is probably not very rare, but is almost always sterile. It can be distinguished by the broken-leaf apices and the other characters given in the key. *D. spurium* does not look like a *Dicranum* because of the equally spreading soft crisped-incurved leaves. Under the microscope its leaves are readily distinguished from those of any other species by the large and conspicuous papillæ which cover the upper part of the back of the leaf and are easily seen because the margins are incurved in this region. *Dicranella heteromalla* has the same general appearance as the *Dicranums*, and is very common. It is smaller than most of the *Dicranums*, and its leaves lack the inflated angular cells so characteristic of *Dicranum*. Other species of this and allied genera may be met with, but they can readily be distinguished from *Dicranum* by the characters mentioned in the last article.

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### GEOGRAPHICAL DISTRIBUTION OF DICRANA.

By RODNEY H. TRUE.

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AT the suggestion of Dr. Grout, I have prepared the following brief statement of the distribution of twenty species of the genus *Dicranum* selected by him. I have used such local lists and similar helps as were at my disposal and wish it born in mind that I am not able to warrant the accuracy of the determinations on which they were founded. I hope, however, that, by reference to a large body of authentic herbarium material, I have been able to give a substantially correct idea of the distribution of these mosses. I should be willing, as far as my time permits, to determine doubtful forms for any who care to send specimens and letter postage for reply.

*Dicranum Bergeri* Bland. A moss characteristically found in marshy places, most frequently in sphagnum bogs; widely distributed.—N. J., New Eng., Can., Greenland, Wis., Minn., Rocky Mts., Alaska.

*Dicranum Blytii* Schimp. (*D. schisti*). A rare Arctic species.—White Mts., Labrador, Greenland, Selkirk Mts., Vancouver Id., Brit. Col.